(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
18 September 2003 (18.09.2003)

PCT

(10) International Publication Number
WO 03/077276 A1

(51) International Patent Classification[7]: H01J 35/08, 35/18

(21) International Application Number: PCT/IB03/00681

(22) International Filing Date: 19 February 2003 (19.02.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
02075913.0 8 March 2002 (08.03.2002) EP

(71) Applicant *(for all designated States except US)*: **KONINKLIJKE PHILIPS ELECTRONICS N.V.** [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

(71) Applicant *(for DE only)*: **PHILIPS INTELLECTUAL PROPERTY & STANDARDS GMBH** [DE/DE]; Steindamm 94, 20099 Hamburg (DE).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **HARDING, Geoffrey** [GB/DE]; c/o Prof . Holstlaan 6, NL-5656 AA Eindhoven (NL). **DOORMANN, Volker** [DE/DE]; c/o Prof . Holstlaan 6, NL-5656 AA Eindhoven (NL). **DAVID, Bernd** [DE/DE]; c/o Prof . Holstlaan 6, NL-5656 AA Eindhoven (NL).

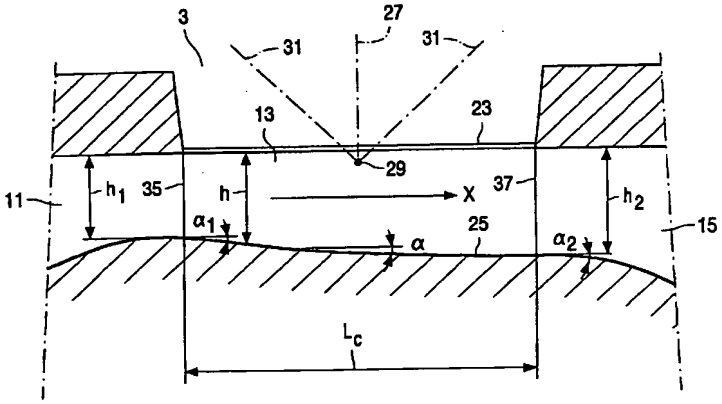
(74) Agent: **WOLFS, Marc, J., M.**; Internationaal Octrooibureau B.V., Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: A DEVICE FOR GENERATING X-RAYS HAVING A LIQUID METAL ANODE



(57) Abstract: The invention relates to a device for generating X-rays (31). The device has a source (5) for emitting electrons (27) accommodated in a vacuum space (3). The X-rays are emitted by a liquid metal as a result of the incidence of the electrons. The liquid metal flows through a constriction (13) where the electrons emitted by the source impinge upon the liquid metal. The constriction is bounded by a thin window (23), which is made from a material which is transparent to electrons and X-rays and which separates the liquid metal in the constriction from the vacuum space. According to the invention, the constriction (13) has a cross-sectional area which, seen in a main flow direction (X), increases in such a manner that during operation in said direction, a decrease of a flow velocity takes place such that a decrease of a pressure of the liquid metal in the constriction in said direction, caused by viscous flow losses, substantially corresponds with an increase of said pressure in said direction, which is caused by the Bernoulli effect resulting from said increase of the velocity. As a result, the pressure of the liquid metal in the constriction can be maintained at a uniform relatively low level throughout the constriction, so that a uniform and relatively low mechanical load is exerted on the window during operation. In this way, the deformation of the window and the risk of breakage of the window are considerably limited.

WO 03/077276 A1